

DAVIS DAM, SWITCHYARDS  
Southeast of Davis Dam  
Kingman vicinity  
Mohave  
Arizona

HAER AZ-77-A  
AZ-77-A

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

DAVIS DAM, SWITCHYARDS

HAER No. AZ-77-A

Location: Southeast of Davis Dam; Kingman, Mohave County, Arizona.  
Mohave County, Arizona  
U.S.G.S. Davis Dam, Arizona-Nevada Quadrangle 7.5 Minute Provisional 1983  
UTM: Davis Dam 230-kV Switchyard: 11.721169.3897693; 11.721174.3897513 (NAD83)  
Davis Dam 69-kV Switchyard: 11.721414.3897364 (NAD83)

Date of Construction: 1949-52

Engineer/Building: Designed by U.S. Bureau of Reclamation, Phoenix, Arizona. Built by contractors for the U.S. Bureau of Reclamation

Present Owner: U.S. Department of Energy, Western Area Power Administration, Phoenix, Arizona

Present Use: Electric power transmission and control

Significance: Davis Dam is significant for its role in control of the lower Colorado River, fulfillment of obligations under the Mexican Treaty of 1944, and economic development of the Southwest after World War II. The electrical switchyards are a critical element of the Davis Dam industrial complex, providing connection and control of electricity produced at Davis Dam power plant for transmission to regional markets and interconnection with other federal power plants by means of regional power grids.

Report Prepared By: Kurt P. Schweigert  
Associated Cultural Resource Experts  
Golden, Colorado

Date: October 2008

## I. Introduction

Two electrical switchyards provide connection of generators at Davis Dam power plant with transmission lines that carry high-voltage current to markets in Arizona, Nevada, and California. The 230-kilovolt (kV) and 69-kV switchyards are located on excavated benches on the Arizona side of the canyon to the southeast of Davis Dam. The 230-kV switchyard includes an upper segment and a lower segment separated by an escarpment, and the 69-kV switchyard is located to the northwest of the lower portion of the 230-kV switchyard. A concrete control conduit extends from the power plant, through the forebay/spillway gate structure, and eastward to the switchyards. Ten high-voltage transmission lines terminate at the switchyards, and a low-voltage transmission line runs to the south of the 69-kV switchyard to provide power to government facilities downstream.

## II. Architectural and Engineering Information

The 230-kV switchyard is a rectangular facility with general dimensions of 920' x 190' and an irregularly shaped extension about 50' to the northwest of the eastern end of the lower section. The switchyard consists of two sections separated by a 52' wide escarpment, so that the southwestern section is about 36' lower in elevation than the northeastern section.

The upper section of the 230-kV switchyard is set on a gravel pad and enclosed by a woven wire and barbed wire fence. The 527' x 190' upper section has eight bays, with seven sets of oil circuit breakers and disconnect switches arranged along the north side of the switchyard and an eighth oil circuit breaker and disconnect switch near the center at the east end. The bus structure is eight sets of three steel towers with horizontal members at two levels. Bus towers and switches are set on small concrete pads, and the oil circuit breakers are set on large, thick concrete slabs. On the north and south sides of the switchyard are five small metal or metal clad fire control structures on concrete block piers, with doors facing the interior of the switchyard. At the west end of the switchyard is a small concrete structure that provides access to a concrete control tunnel; the access structure is about 8' high and has a steel pedestrian door facing the upper yard. The subterranean control tunnel extends in a straight line from the middle of the upper section of the 230-kV switchyard, through the centers of the upper and lower sections of the 230-kV switchyard, to the west end of the 230-kV switchyard; it then angles to the northwest, through the 69-kV switchyard, to the forebay/spillway structure, and then to the power plant.

The upper section of the 230-kV switchyard accepts current from Units 1, 2, and 3 of the Davis Dam power plant by means of transmission lines running from the power plant roof. The upper section of the 230-kV switchyard is a terminus for four 230-kV transmission lines: Davis-Mead (formerly called Davis-Hoover then Davis-Mead, then Davis-Mead No. 1), Davis-McConnico (formerly called the Davis-Coolidge then the Davis-Prescott), Davis-Topock No. 2 (formerly called Davis-Parker No. 2), and Davis-Riviera.

The lower section of the 230-kV switchyard is 343' x 190' in general dimensions. The bus structures are identical in design to those in the upper section, except the lower section has six sets of three bus towers. The lower section has six bays, with five sets of oil circuit breakers along the west side and a sixth set at the center near the west end. Another oil circuit breaker serves a transmission line running from the lower to the upper sections of the 230-kV switchyard. Five small arrow-shaped structures are along the north and south edges of the switchyard. One of these buildings has been partly demolished, revealing a fire hydrant. An irregularly shaped extension to the north of the eastern half of the lower section contains a metal-clad, gabled, wood-frame service building that houses capacitor-potential device adjustment units, oil handling and filtering equipment, a repair shop and office, and a water pump. It has a poured concrete foundation, four-light fixed windows, and a sheet-metal roof straddled by two ventilators. Adjacent the service building are two large oil storage tanks on a concrete cradle and a large transformer that provides power to the 69-kV switchyard.

The lower section of the 230-kV switchyard accepts current from Units 4 and 5 of the Davis Dam power plant by means of transmission lines from the power plant roof. The lower section is a terminus for two 230-kV transmission lines: Davis-Topock No. 1 (formerly Davis-Parker No. 1), and Davis-McCullough (formerly Davis-Mead No. 2).

The Davis 69-kV switchyard is 114'-0" x 108'-0" and has three bays. Bus structures are of flat top, strain-bus type with a double-buss switching arrangement. The 69-kV switchyard has two 230/69-kV transformers and a regulator at the southeast end of the facility. The bus structure consists of five sets of three towers with two sets of cross members and laterals and a third lateral on the east end of the north side. Two switch control boxes are at the center of the switchyard, and spare oil circuit breakers are stored at the north corner of the switchyard. Bus towers are set on small poured-concrete slabs, and transformers and control boxes are set on larger poured-concrete slabs. The entire switchyard has a gravel pad and is surrounded by a woven and barbed-wire fence.

The 69-kV switchyard accepts current from the lower section of the 230-kV switchyard by means of a wood pole transmission line, and also accepts current directly from the bus structure on the power plant roof by means of a transmission line. The 69-kV switchyard is a terminus for four 69-kV transmission lines: Davis-Kingman, Davis-Riviera, Davis-Silver Creek, and Davis-Aha Macav (formally called the Davis-Needles). The 69-kV switchyard also serves a 4.16-kV feeder line for Bureau of Reclamation and National Park Service facilities to the south of the dam and switchyard area; this surface line augments or replaced a double-circuit line that runs from an extension of the control tunnel at the southeast base of the forebay/spillway structure.

### III. Design, Construction, and Alterations

The initial planned location for the 230-kV switchyard was on the Nevada side of the canyon, to the north of the west end of Davis Dam, but that location was determined to be too distant from the power plant. A second site on the west side for the forebay channel was also dismissed, in part because the site finally chosen for the switchyard complex provided much better terrain for transmission line approach to the switchyards.<sup>1</sup> Under provisions of its contract for construction of the dam, the Utah Construction Company performed the excavation and grading for the multi-leveled switchyard plan on the Arizona side of the canyon, as well as the construction of the control cable tunnel.

#### 230-kV Switchyard

In September 1949, the Bureau of Reclamation awarded a contract to the firm of Donovan-Wismer-James and Becker to install the electrical and hydraulic machinery in Davis Dam and build the 230-kV switchyard. The firm began work on the switchyard in late 1949 and completed construction in mid-1951. The switchyard featured sectionalized double busses, with the south bus arranged as the main bus and the north bus as a transfer for outgoing transmission lines. The switchyard also included single oil circuit breakers for Units 1, 3, and 5 and double breakers for Units 2 and 4. Each transmission line take-off unit was equipped with double breakers, and the spare line position was similarly designed. The original design of the 230-kV switchyard provided for the eventual interconnection with transmission lines originating from the proposed Bridge Canyon Power Plant, which was never built.<sup>2</sup>

General Electric Company provided five 45,000 to 56,250/600,00-kva, 13,600- to 132,800/230,000 Y-volt, e-phase, 60-cycle, oil immersed, self-cooled/forced-air-cooled, outdoor-type power transformers; complete with oil for a cost of \$1,081,300.00. Other General Electric equipment installed in the switchyard included oil circuit breakers,

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<sup>1</sup> Bureau of Reclamation, "Davis Dam and Powerplant: Technical Record of Design and Construction," United States Department of the Interior, 1955: 173.

<sup>2</sup> Bureau of Reclamation, "Davis Dam Project, Arizona – Nevada Annual Project History." United States Department of the Interior, 1950a: 3.

disconnecting switches, and lightning arresters for at a cost of \$957,746.20.<sup>3</sup> Gilmore Fabricators, Inc. of Oakland, California provided and installed the bus structures for the 230-kV switchyard at a cost of \$134,750.<sup>4</sup>

As originally built, the 230-kV switchyard had nine bays, with four bays located at elevation 736.33' amsl (upper section) and the remaining five at elevation 700.33' amsl (lower section). The busses of these two switchyard sections were connected through two 196-kV, 1,200-ampere, 3-pole, single-throw, manually-gang-operated, outdoor-type disconnecting switches with arcing horns, installed on supporting steel structures. The switchyard had thirteen 230/196-kV, 3-pole, single-throw outdoor type oil circuit breakers, having an interrupting capacity (3-phase at rated voltage and frequency) of 3,500,000-kva, an interrupting time of three cycles and reclosing time of twenty cycles. The circuit breakers were located in the following positions: two breakers in each of Generator Bays Y2 and Y5, one breaker only in each of Generator Bays Y1, Y3, and Y4, and two breakers in each of Line Bays Y9, Y8, and Y6. General Electric Company. furnished the oil circuit breakers under Specifications No. 1820, Schedule No. 1, Item No. 1. The switchyard had two 196-kV, 1,200 ampere, 3-pole, single-throw, manually-gang-operated, outdoor-type disconnecting switches with arcing horns. The switches were located in the north and south buses for bus sectionalizing and were located adjacent to column Line 7 in the upper portion of the 230-kV switchyard. The disconnecting switches were mounted on supporting bases 10'-6" above the ground and were not equipped with grounding blades. Each switch operating mechanism had an eight-stage auxiliary switch providing control circuits that could be changed to "circuit opening" or "circuit closing" as required.<sup>5</sup>

Unit No. 1 of the Davis Dam power plant was placed in operation on January 5, 1951, transmitting current to Bay Y1 of the upper section of the 230-kV switchyard. The remaining four power plant generating units were placed in service by late fall, 1951, and the 230-kV switchyard was completed and fully functional by the end of that year.<sup>6</sup> The switchyard remained essentially unchanged until 1967, when additions were made to accommodate a Mohave Electric Cooperative transmission line. The additions included excavation of about 5,800 cubic yards of earth for installation of a 30 MVA 230/69-kV auto transformer with 25-kV tertiary, construction of associated steel structure foundations, and installation of one 230-kV, 10,000 kVA, 1600-ampere oil circuit breaker; two 230-kV, 1200-amp disconnect switches, and insulating oil facilities; about 245 feet of 7-foot chain-link fence; installation and connection of new 230-kV lines from the main 230-kV switchyard to the new transformer; and installation of 69-kV lines from the new transformer to the 69-kV switchyard. The oil circuit breaker for the 69-kV addition was purchased from Allis Chalmers Manufacturing Company, and disconnecting switches and autotransformer were purchased from Westinghouse.<sup>7</sup>

During the mid-1970s, Reclamation upgraded 230-kV switchyards at Parker Dam and Davis Dam to provide increased capacity for the Parker-Davis Project, Central Arizona Project, and Pacific Northwest-Pacific Southwest Intertie transmission systems.<sup>8</sup> Stage 02 work at Davis Switchyard included removal of existing foundations, modification of some existing foundations, removal of a chain-link fence and erection of a larger fence, excavation for grading and structures, installation of two single switch-operating platforms, installation of two double switch-

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<sup>3</sup> Bureau of Reclamation, "Contract No. 12r-17660, Power Transformers for Davis Power Plant, October 6, 1947," United States Department of the Interior, 1947; Bureau of Reclamation, "Davis Dam Project, Arizona - Nevada, Annual Project History," United States Department of the Interior, 1948.

<sup>4</sup> Bureau of Reclamation, "Davis Dam Project, Arizona - Nevada, Annual Project History," United States Department of the Interior, 1949.

<sup>5</sup> Bureau of Reclamation, "Davis Dam and Power Plant Designer's Operating Criteria, Volume 1." United States Department of the Interior, 1950: 41, 44.

<sup>6</sup> Bureau of Reclamation, "Davis Dam Project, Arizona - Nevada, Annual Project History," United States Department of the Interior, 1951: 4, 22, 28-9.

<sup>7</sup> Bureau of Reclamation, "Parker Davis Project, Annual Project History," United States Department of the Interior, 1967.

<sup>8</sup> Bureau of Reclamation, "Parker Davis Project, Annual Project History," United States Department of the Interior, 1976.

operating platforms, installation of an equipment cabinet, removal and reinstallation of three single-switch-operating platforms, erection of new steel structures, removal and re-erection of existing steel structures, dismantling and modification of steel structures, modification of oil piping; installation of one 230-kV 1600-ampere power circuit breaker; installation of twelve 230-kV, 3-pole, 2,000-ampere power circuit breakers; installation of two 230-kV, 3-pole, manually group-operated, selector type disconnecting switches with grounding blades; installation of four 14.4-kV, single-pole, hook-operated disconnecting switches with grounding blades; installation of three 180-kV, station-class surge arresters; installation of three 230-kV, extra-high capacity coupling capacitors with potential devices; and installation of two power-line carrier line inductors.<sup>9</sup>

Also as elements of Stage 02 modifications, the Davis-Parker No. 1 transmission line was removed in the span from the takeoff structure in Bay Y6 to the Type SL-60 structure at Station 77+89.7, and the line was rebuilt from the takeoff structure in Bay Y8 to the SL-60 structure. The Davis-Prescott transmission line was removed from the takeoff structure in Bay Y3 to the Type TL-70 structure at Station 30+24, and rebuilt from the takeoff structure in Bay Y11 to the TL-70 structure. Transformer Circuits Nos. 2 and 3 were also rebuilt. The Davis-Parker No. 2 transmission line was completed from the takeoff structure in Bay Y10 to the Type TH-70 structure at Station 27+54.34.<sup>10</sup> In 1983, a new 230-kV bay was constructed to accommodate the Arizona Electric Power Company (AEP) Davis-Riviera transmission line, which was constructed to exit to the south of the original Y9 bay in the upper section of the 230-kV switchyard.<sup>11</sup>

#### 69-kV Switchyard

Construction of the 69-kV switchyard followed completion of the 230-kV switchyard. Like the 230-kV switchyard, the 69-kV switchyard was designed by the Davis Transmission System Design Unit of the Bureau of Reclamation in Phoenix.<sup>12</sup> Emsco Derrick and Equipment Company installed the 69-kV switchyard bus structure, two potential transformer supports, one voltage regulator switch support, eight single-switch operating platforms, and two double-switch operating platforms in late 1951 and early 1952.<sup>13</sup>

George E. Miller Company constructed the electrical wiring and equipment in the 69-kV switchyard and transformer circuit in 1952. The company also constructed a 14,400' long tap line from the 69-kV switchyard to the 3T-2 structure on the existing Davis-Kingman transmission line. Transformers initially installed in the 69-kV switchyard were rewound 66-kV units that the Bureau of Reclamation purchased from Wagner Electric Company in 1945. The units originally were 2,000-kVA, 66,000 to 2,400 volts, oil-immersed, self-cooled, and without trucks or geared tap changers.<sup>14</sup>

In 1961, Reclamation purchased and installed a power transformer and a voltage regulator for the 69-kV switchyard.<sup>15</sup> In 1962, Reclamation made substantial additions to the 69-kV switchyard, including earthwork and relocation of the chain link fence on the southeastern end of the original yard; construction and installation of foundations, steel structures, electrical equipment, and wiring for additional 69-kV service; installing equipment for

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<sup>9</sup> Bureau of Reclamation, "Parker Davis Project, Annual Project History," 1976.

<sup>10</sup> Ibid.

<sup>11</sup> Western Area Power Administration, "Contract No. DE-ME65-82WP39130, Modifying the Davis 230+-kv Switchyard and Control Room, January 19, 1983," United States Department of Energy, 1983.

<sup>12</sup> Bureau of Reclamation, "Davis Dam Project, Arizona – Nevada, Annual Project History," 1948: 20.

<sup>13</sup> Bureau of Reclamation, "Davis Dam Project, Arizona – Nevada, Annual Project History," 1952.

<sup>14</sup> Bureau of Reclamation, "Davis Dam Project, Arizona – Nevada, Annual Project History," 1951, 1952.

<sup>15</sup> Bureau of Reclamation, "Parker Davis Project, Annual Project History," United States Department of the Interior, 1961.

a 4.16-kV circuit and constructing a 4.16-kV power line from the 69-kV switchyard to the existing government camp; and removal of a 69-kV regulator from the switchyard.<sup>16</sup>

#### IV. Project Information

This documentation has been prepared at the request of the U.S. Department of Energy, Western Area Power (Western), Phoenix, Arizona to fulfill Western's responsibilities under Section 106 of the National Historic Preservation Act. Davis Dam and associated features have been determined to be eligible for nomination to the National Register of Historic Places as an historic district. Western has considered the effects on cultural resources caused by replacing electrical equipment in the switchyards that have become unreliable due to age. This HAER documentation partially fulfills the Special Conditions of Compliance for Section 106 and the implementing regulations 36 CFR § 800, as specified in a Memorandum of Agreement between Western and the Arizona State Historic Preservation Officer.

This documentation was accomplished by Associated Cultural Resource Experts (ACRE), Denver, Colorado. Kurt P. Schweigert of ACRE was Principal Investigator and prepared the second draft and final documentation packages. Douglas M. Edwards of ACRE was the photographer, and Peggy Beedle of ACRE assisted in field documentation and photography.

Research for this HAER documentation focused on the electrical switchyards within the Davis Dam complex. Most information was drawn from records, reports, and drawings and specifications held by Western Area Power Administration in Phoenix and Denver, and from similar documents held by the U.S. Bureau of Reclamation in Denver, Colorado; Boulder City, Nevada; and at Davis Dam. Information was also drawn from an intensive cultural resources inventory of Bureau of Reclamation lands at Davis Dam (ACRE and HRA Conservation Archaeology 2005). Research conducted for the current documentation of the electrical switchyards does not provide adequate information for documentation of the engineering character and construction history of the dam structure, power plant, and other features of the complex.

#### V. Sources

##### Published Sources

ACRE and HRA Conservation Archaeology. "Intensive Cultural Resource Inventory of Bureau of Reclamation Lands in the Vicinity of Davis Dam, Clark County, Nevada and Mohave County, Arizona," 2005.

Bureau of Reclamation. "Contract No. I2r-17669, Power Transformers for Davis Power Plant, October 6, 1947." Phoenix, Arizona : United States Department of the Interior, Bureau of Reclamation, 1947. On file at Western Area Power Administration, Phoenix, Arizona.

\_\_\_\_\_. "Davis Dam Project, Arizona – Nevada, Annual Project History." Lakewood, Colorado: United States Department of the Interior, Bureau of Reclamation, 1948. On file at the Bureau of Reclamation Library, Lakewood, Colorado.

\_\_\_\_\_. "Davis Dam Project, Arizona – Nevada, Annual Project History." Lakewood, Colorado: United States Department of the Interior, Bureau of Reclamation. 1949. On file at the Bureau of Reclamation Library, Lakewood, Colorado.

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<sup>16</sup> Bureau of Reclamation, "Parker Davis Project, Annual Project History," 1976.

- \_\_\_\_\_. "Davis Dam Project, Arizona – Nevada, Annual Project History." Lakewood, Colorado: United States Department of the Interior, Bureau of Reclamation, 1950. On file at the Bureau of Reclamation Library, Lakewood, Colorado.
- \_\_\_\_\_. "Davis Dam and Power Plant Designers' Operating Criteria, Vol. 1, December 1950." Laughlin, Nevada: United States Department of the Interior, Bureau of Reclamation, 1950. On file at the Bureau of Reclamation, Davis Dam, Laughlin, Nevada.
- \_\_\_\_\_. "Davis Dam Project, Arizona – Nevada, Annual Project History." Lakewood, Colorado: United States Department of the Interior, Bureau of Reclamation, 1951. On file at the Bureau of Reclamation Library.
- \_\_\_\_\_. "Davis Dam Project, Arizona – Nevada, Annual Project History." Lakewood, Colorado: United States Department of the Interior, Bureau of Reclamation, 1952. On file at the Bureau of Reclamation Library, Lakewood, Colorado.
- \_\_\_\_\_. "Davis Dam and Powerplant: Technical Record of Design and Construction." Denver, Colorado: United States Department of Interior, Bureau of Reclamation, 1955.
- \_\_\_\_\_. "Parker Davis Project, Annual Project History." Denver, Colorado: United States Department of the Interior, Bureau of Reclamation, 1961.
- \_\_\_\_\_. "Parker Davis Project, Annual Project History." Denver, Colorado: United States Department of the Interior, Bureau of Reclamation, 1967.
- \_\_\_\_\_. "Parker Davis Project, Annual Project History." Denver, Colorado: United States Department of the Interior, Bureau of Reclamation, 1976.
- Linenberger, Toni R. "The Parker-Davis Project (Third Draft)." Denver, Colorado: Bureau of Reclamation History Program, 1997.
- Western Area Power Administration. "Contract No. DE-ME65-82WP39130, Modifying the Davis 230+-kv Switchyard and Control Room, January 19, 1983." Phoenix, Arizona: U.S. Department of Energy, Western Area Power Administration, 1983.

#### Maps and Drawings

- Bureau of Reclamation (all drawings on file at Western Area Power Administration, Lakewood, Colorado).
- 351-317-1707, Davis Power Plant, 4.16 and 69 KV. Switchyards "X" and "V", Plans and Sections. 1951, revised 1961, 1962, 1966.
- 351-317-1717, Davis Power Plant, 4.16 and 69 KV. Switchyards "X" and "V", Plans and Sections. 1951, revised 1961, 1962, 1966, 1971.
- 351-317-1718, Davis Power Plant, 69 KV. Switchyard "V", Lighting Plan and Sections. 1951, revised 1961, 1966, 1971.
- 351-317-1719, Davis Power Plant, 69 KV. Switchyard "V", Conduit, Embedded Conduit, Buried Cable & Grounding. 1951, revised 1961, 1961, 1962, 1966, and 1971.
- 351-317-1743, Davis Power Plant – Steel Structures, 69 KV. Bus Structure, General Plans and Elevations and Assemblies. 1951, revised 1951, 1961.



351-317-1886, Davis Power Plant, Steel Structures, 69 KV. Switchyard, Miscellaneous Structural Steel. 1951.

351-D-0056, Davis Dam and Power Plant, Location Map. 1942, revised 1945, 1947, 1950.

351-D-1320, Davis Switchyards, 230 KV. Switchyard – Steel Structures, Bus Structure, General Plans and Elevations. 1948.

351-D-1321, Davis Switchyards, 230 K.V. Switchyard – Steel Structures, Bus Structure, Column Assemblies. 1948, revised 1948, 1975.

351-D-1322, Davis Switchyards, 230 K.V. Switchyard – Steel Structures, Bus Structure, Beam Assemblies. 1948, revised 1948, 1975.

351-D-2190, Davis Power Plant, 230 KV. Switchyard Service Building, Architectural Plan, Elevations, and Sections. 1949, revised 1949, 1950, 1951.

351-D-2317, Fire Protection System, Standard Hose and Hydrant House for Substations and Switchyards. 1948, revised 1950.

351-D-2318, Davis Power Plant, 230 KV. Switchyard Fire Protection System, Upper and Lower Yard Hose House Arrangement. 1949.

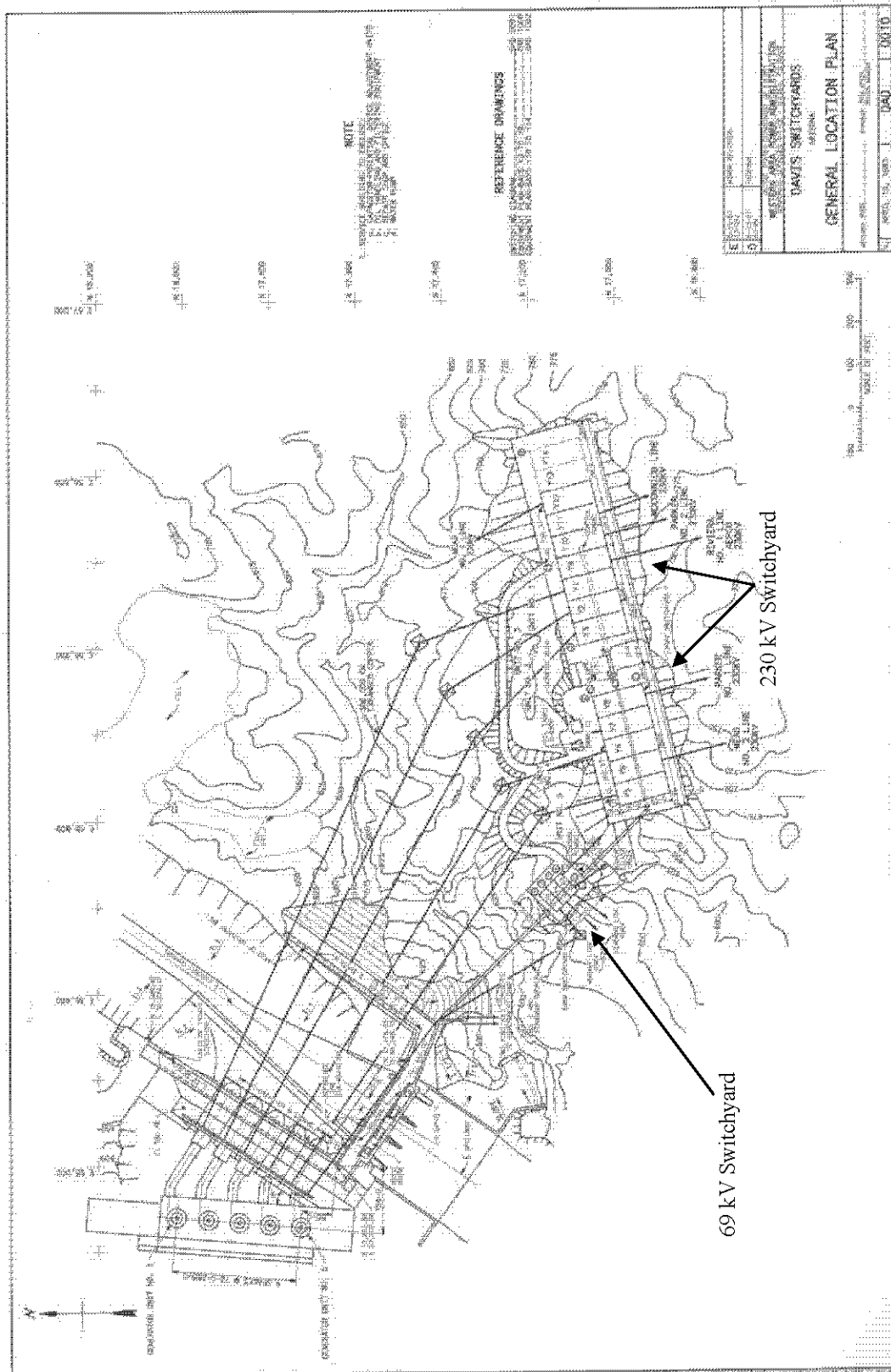
351-D-2320, 230 K.V. Switchyard – Service Building, Oil Purifier Room – General Arrangement. 1948, revised 1949.

Western Area Power Administration (all drawings on file at Western Area Power Administration, Lakewood, Colorado)

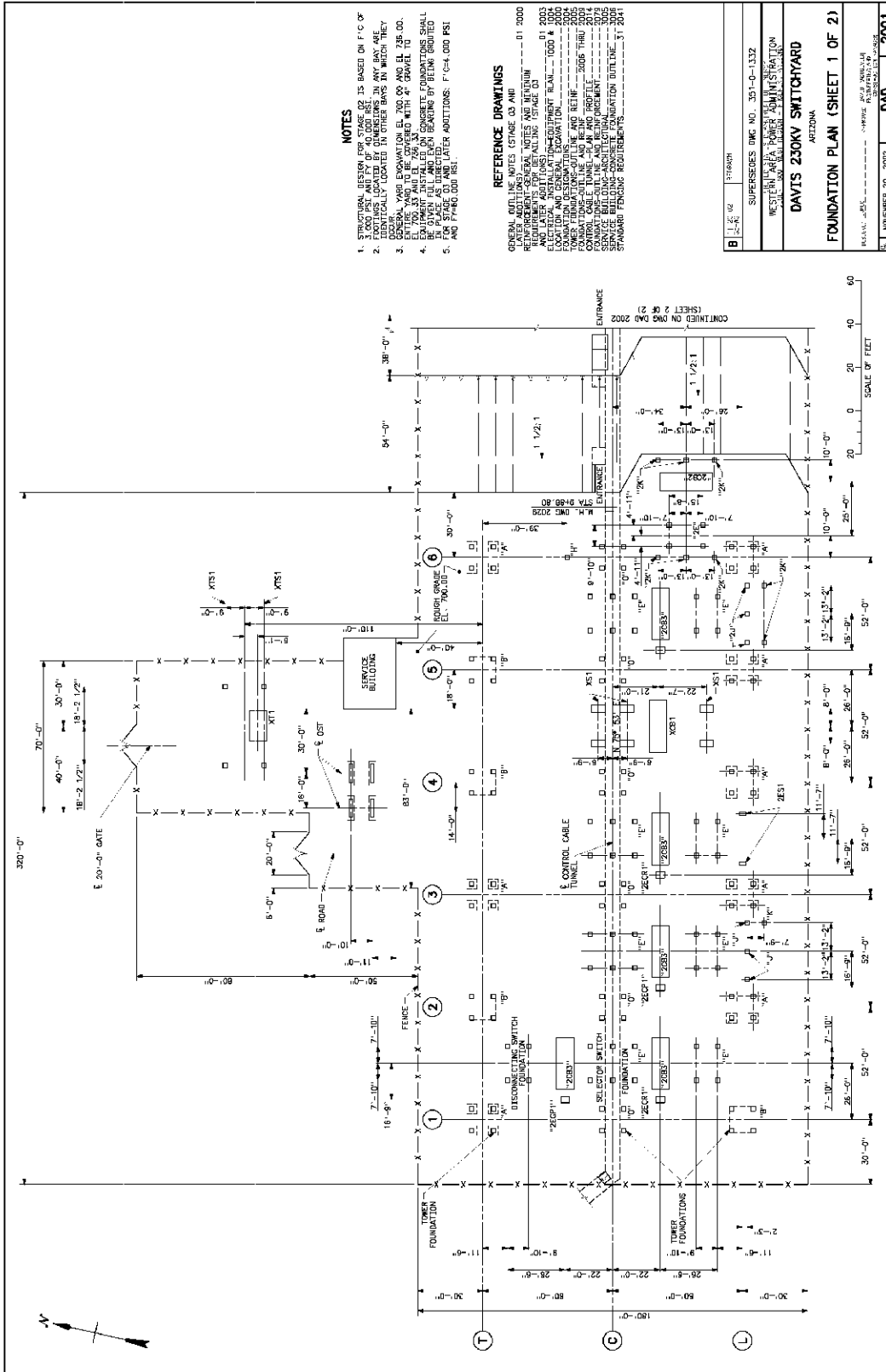
DAD 0010, Davis Switchyards, Arizona, General Location Map. 1983, revised 1997, 2000.

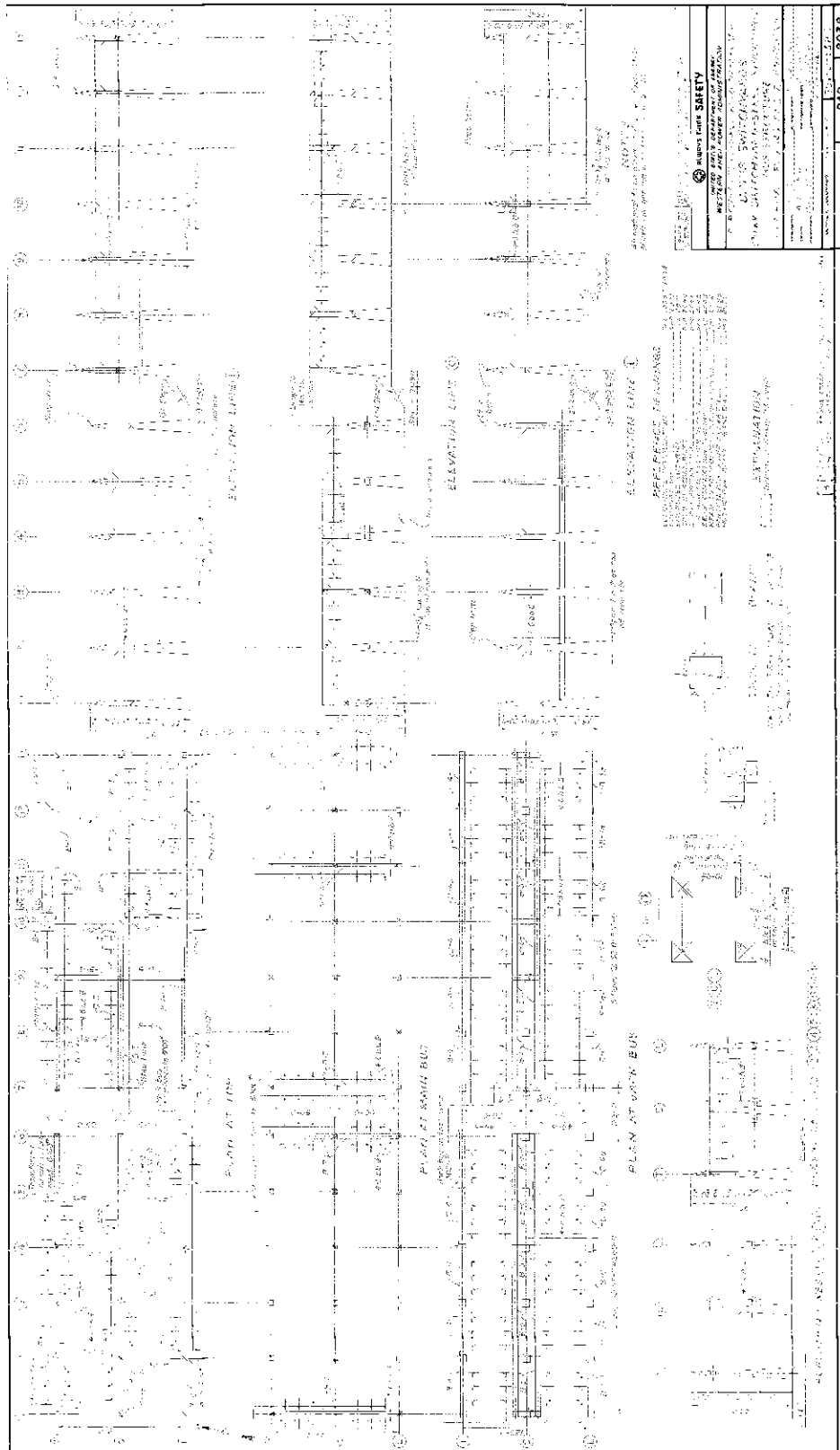
DAD 2001, Davis 230KV Switchyard, Arizona, Foundation Plan. 2002.

DAD 2003, Davis 69KV Switchyard, Arizona, Foundation Plan. 1983, revised 1997.



Davis Switchyards, Arizona, General Location Plan  
Drawing No. DAD 0010 (reduced), original drawing on file at Western Area Power Administration, Lakewood, Colorado

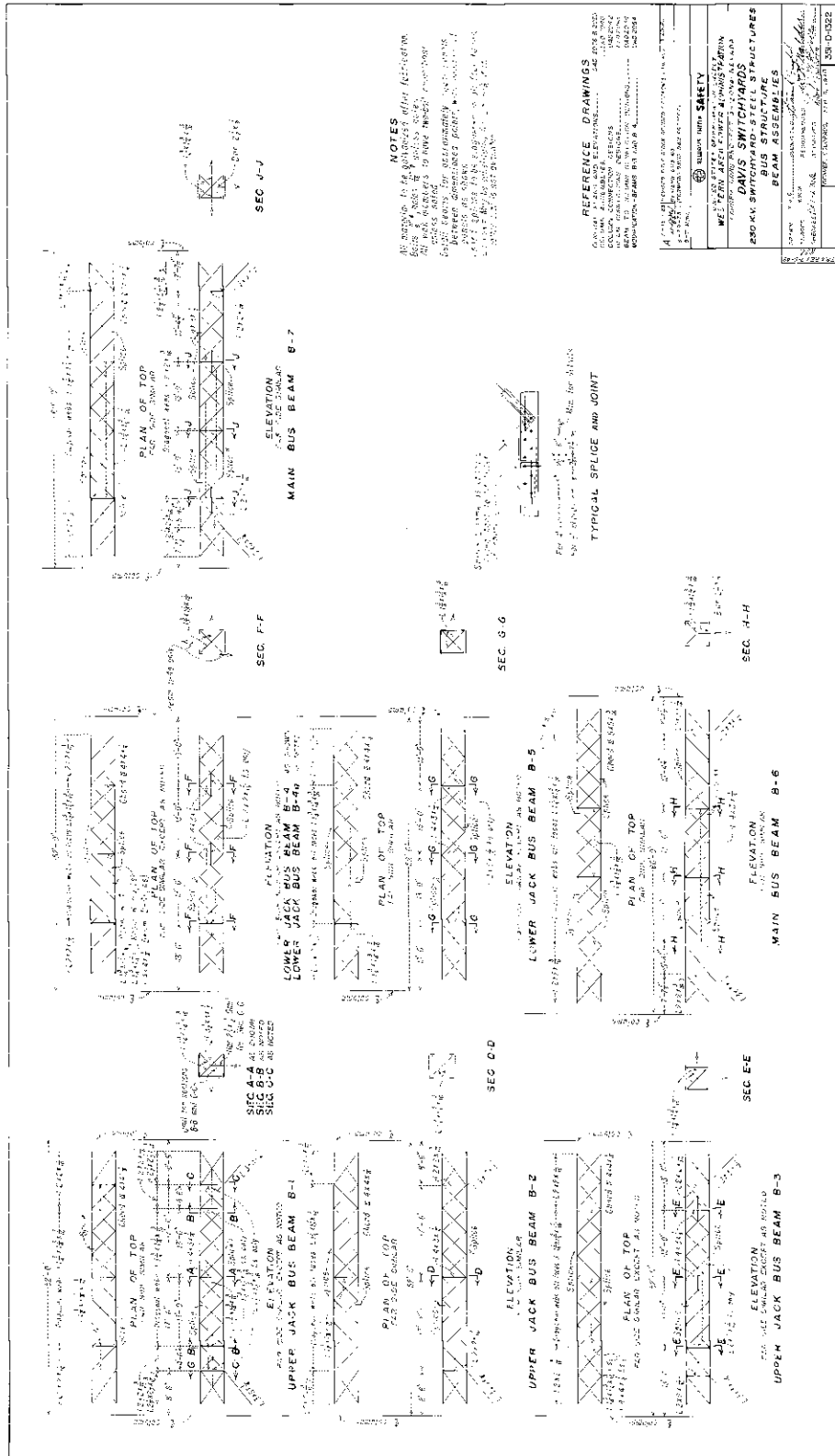




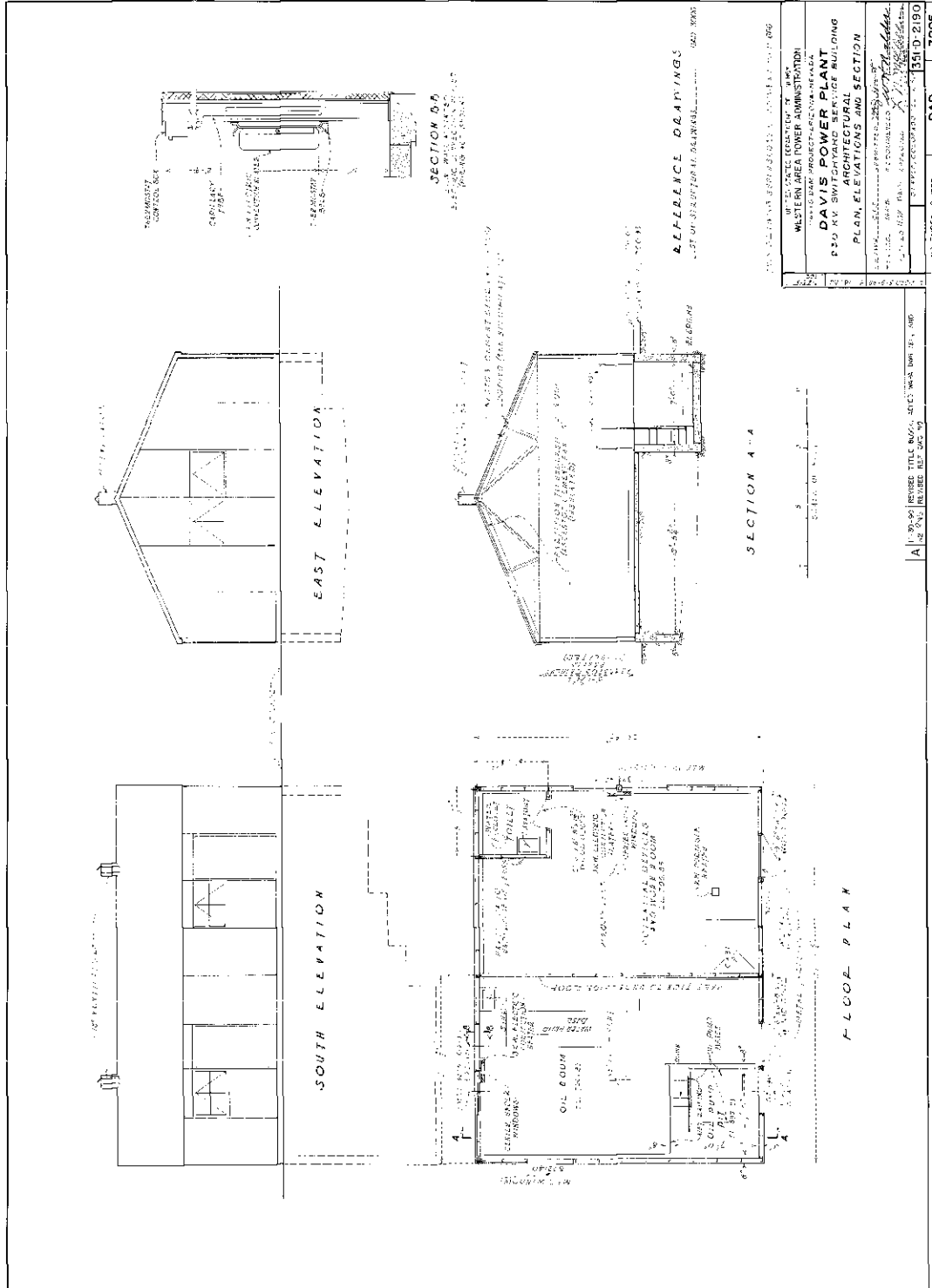
230 KV. Switchyard – Steel Structures, Bus Structure, General Plans and Elevations  
Drawing 351-D-1320 (reduced), original pencil drawing on file at Western Area Power Administration, Lakewood, Colorado



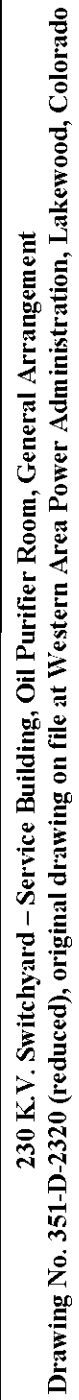
**230 KV. Switchyard – Steel Structures, Bus Structure, Column Assemblies**  
**Drawing 351-D-1321 (reduced), original drawing on file at Western Area Power Administration,**



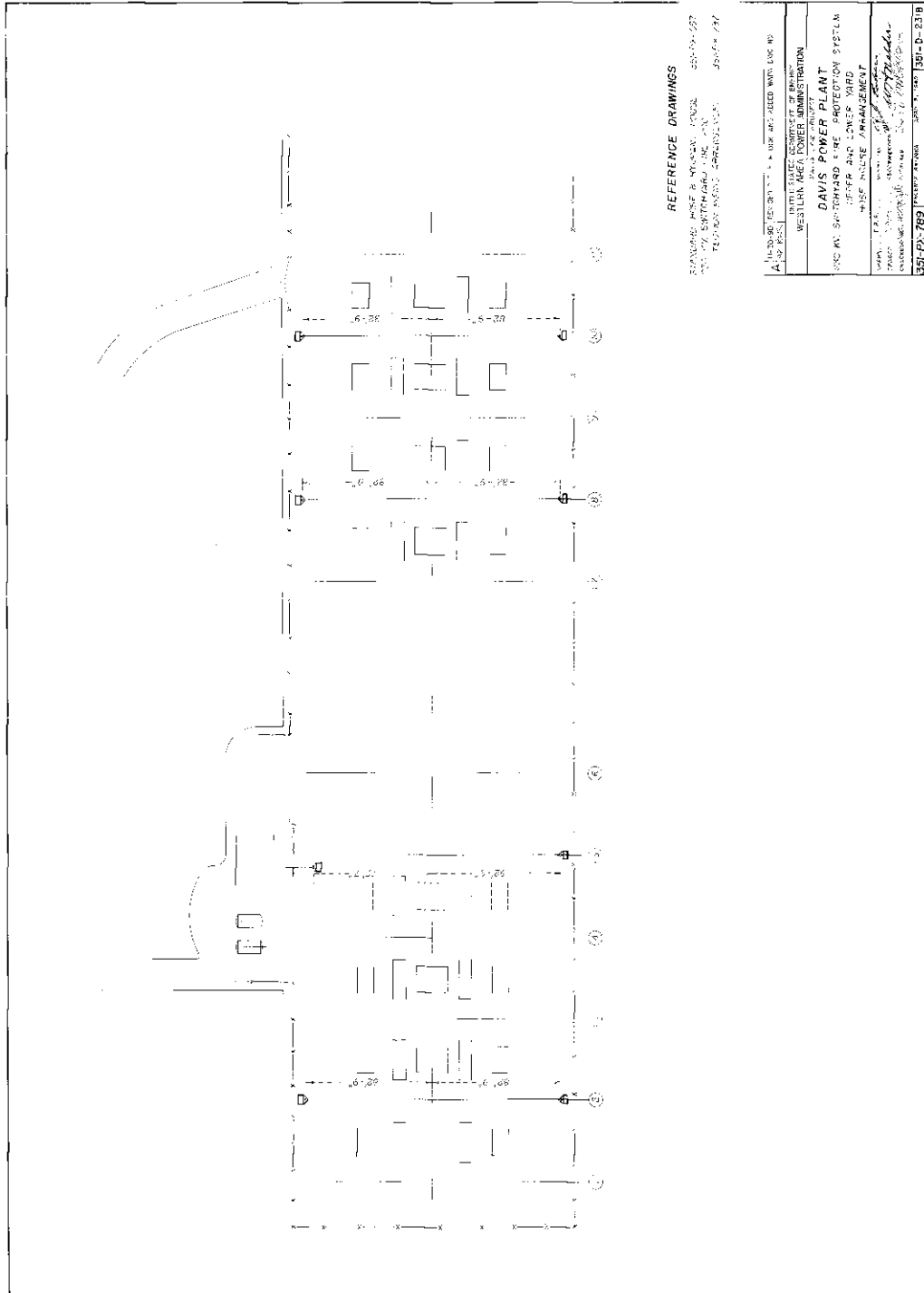
230 KV. Switchyard - Steel Structures, Bus Structure, Beam Assemblies  
Drawing 351-D-1322 (reduced), original drawing on file at Western Area Power Administration, Lakewood, Colorado



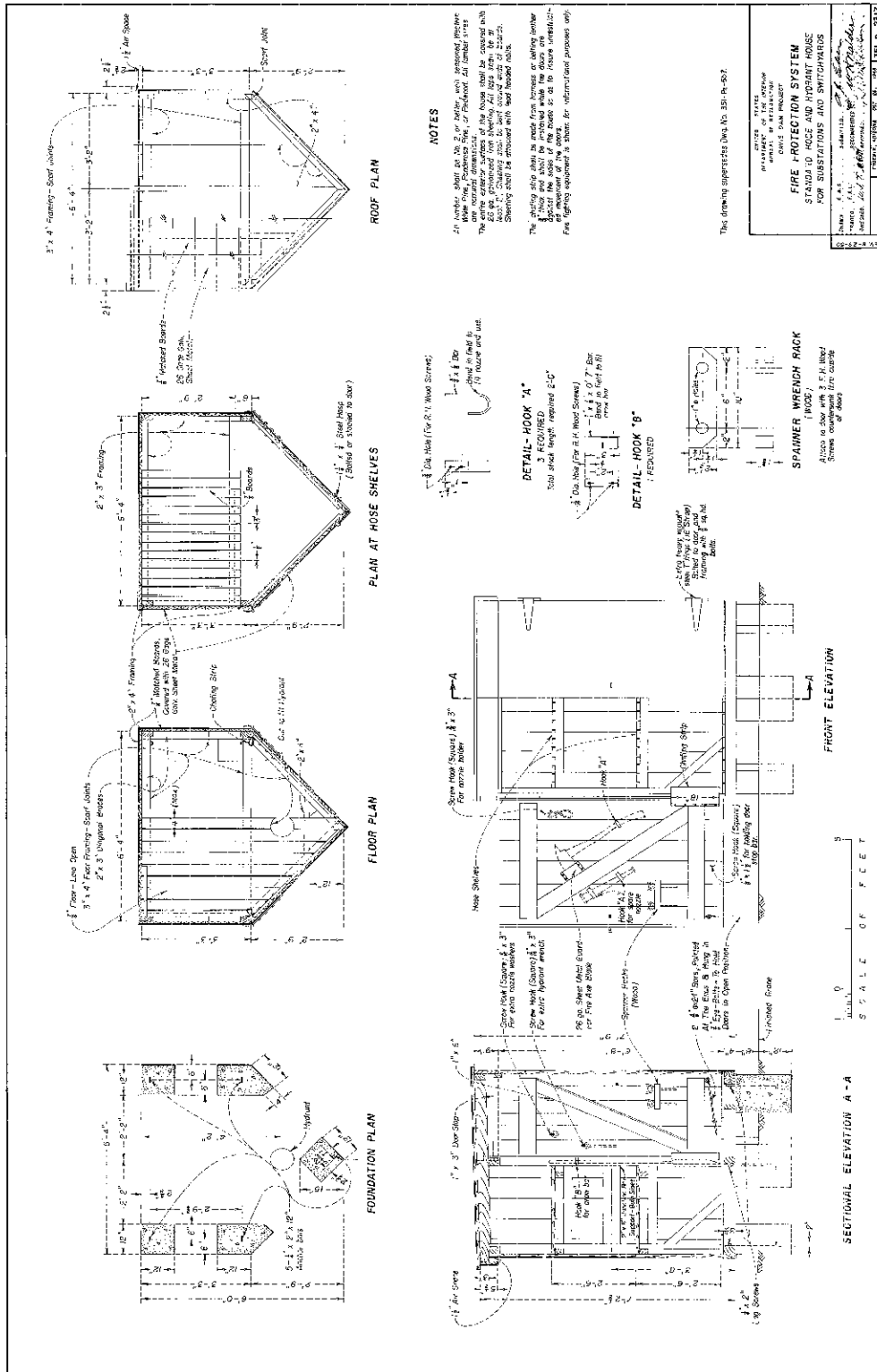
230 KV. Switchyard Service Building, Architectural Plan, Elevations and Sections  
Drawing 351-D-2190 (reduced), original drawing on file at Western Area Power Administration, Lakewood, Colorado

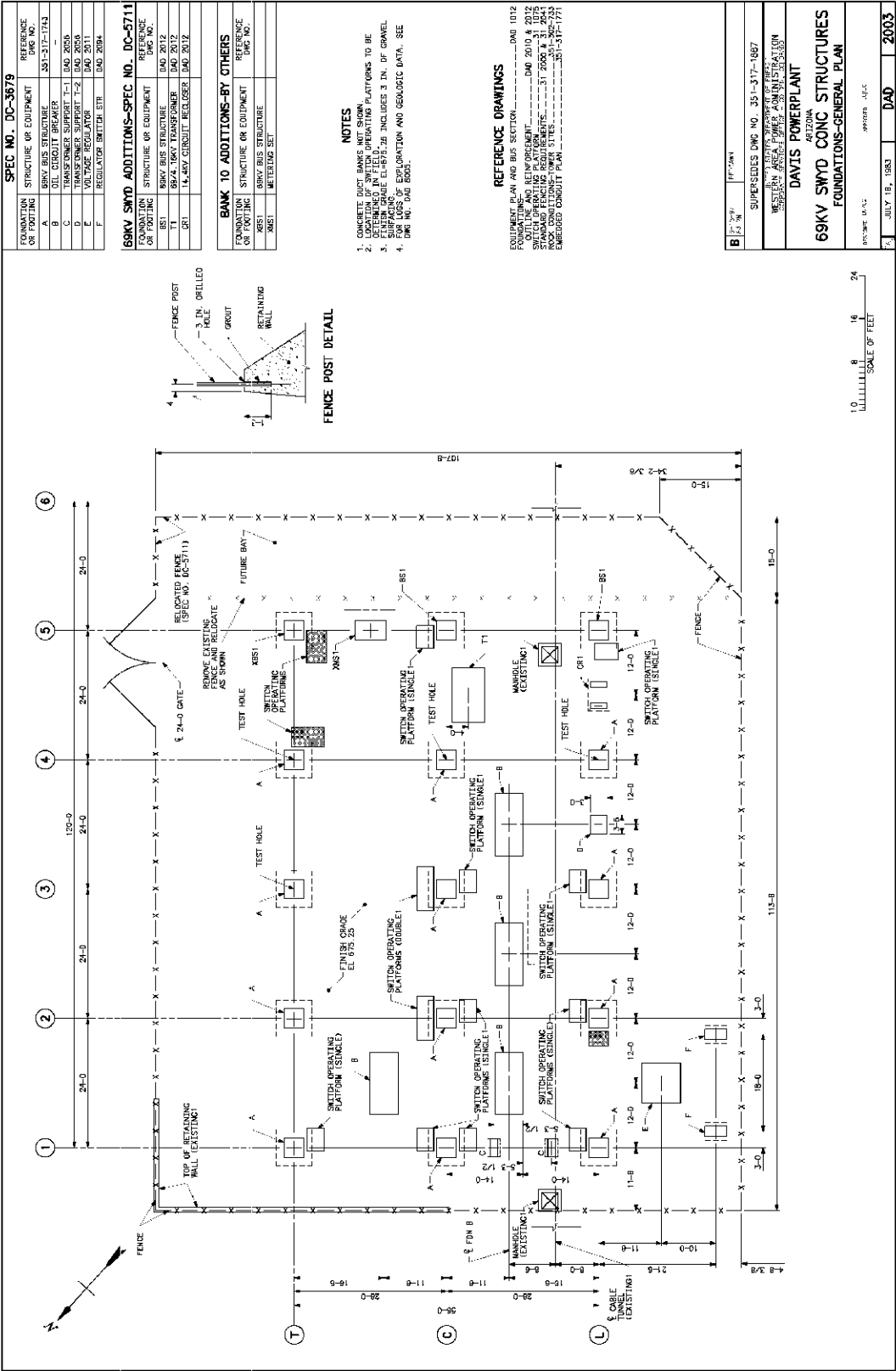






**230 KV. Switchyard Fire Protection System, Upper and Lower Yard Hose Arrangement  
Drawing 351-D-2318 (reduced). original drawing on file at Western Area Power Administration. Lakewood, Colorado**





SPEC NO. DC-3679	
FOUNDATION OR FOOTING	STRUCTURE OR EQUIPMENT
A	69KV BUS STRUCTURE
B	69KV BUS STRUCTURE
C	TRANSFORMER SUPPORT T-1
D	TRANSFORMER SUPPORT T-2
E	VOLTAGE REGULATOR
F	REGULATOR SWITCH STR.

69KV SWYD ADDITIONS-SPEC NO. DC-5711	
FOUNDATION OR FOOTING	STRUCTURE OR EQUIPMENT
BS1	69KV BUS STRUCTURE
T1	69KV TRANSFORMER
OR1	14.4KV CIRCUIT BREAKER

BANK 10 ADDITIONS-BY OTHERS	
FOUNDATION OR FOOTING	STRUCTURE OR EQUIPMENT
XBS1	69KV BUS STRUCTURE
XMS1	METERING SET

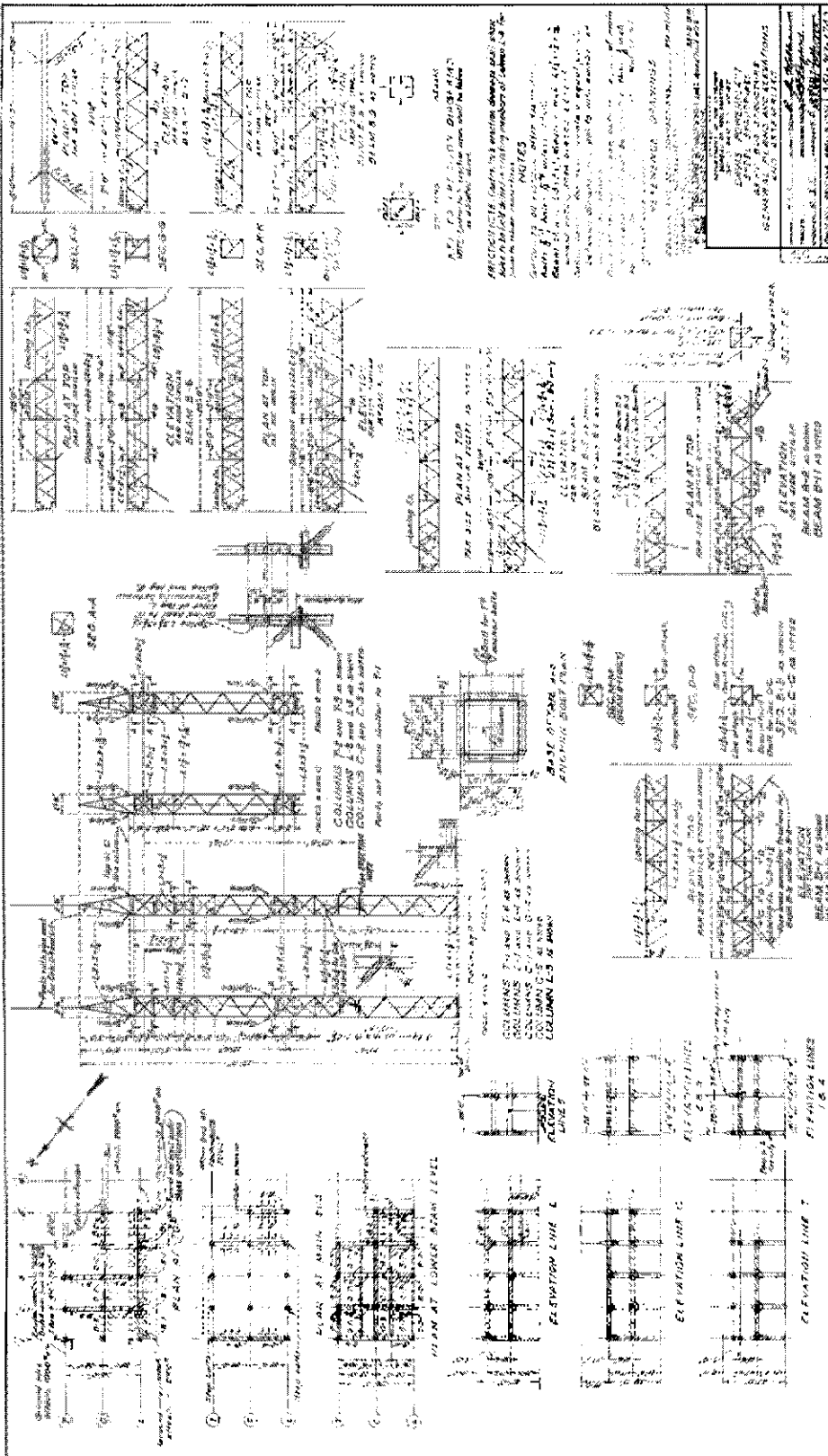
NOTES

1. CONCRETE DIRT BANKS WITH SHARP SLOPES SHALL BE CONSIDERED AS EXISTING.
2. DETERMINED IN FIELD TO INCLUDE 3 IN. OF GRAVEL SURFACING.
3. SURFACING SHALL BE 3 IN. OF GRAVEL SURFACING.
4. SEE NOTES FOR EXISTING AND PROPOSED DATA. SEE DAD 1012.

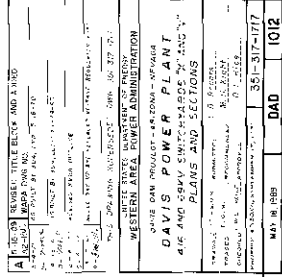
REFERENCE DRAWINGS

- EQUIPMENT PLAN AND BUS SECTION  
DAV 1012  
OUTLINE AND REINFORCEMENT  
DAV 2010 & 2012  
STANDARD FENCING REQUIREMENTS  
DAV 31 2000 & 31 2049  
ROCK CONDITIONS-TOWER SITES  
DAV 1-202-723  
EMERGENCY CONDUIT PLAN  
DAV 31-17-171

B	1/2" = 1'-0"	1/4" = 1'-0"
SUPERSEDES DAD NO. 35-317-1087		
WESTERN AREA POWER ADMINISTRATION		
DAVIS POWERPLANT		
69KV SWYD CONC STRUCTURES		
FOUNDATIONS-GENERAL PLAN		
DESIGNED BY	APPROVED BY	DATE
JULY 18, 1983	DAD	2003



69 KV. Bus Structure, General Plans and Elevations  
Drawing No. 351-317-1743 (reduced), original drawing on file at Western Area Power Administration, Lakewood, Colorado



4.16 and 69KV Switchyards "X" and "Y" Plans and Sections  
Drawing No. 351-317-1717 (reduced), original drawing on file at Western Area Power Administration, Lakewood, Colorado

